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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/764,242

01/19/2001

George Wong

CS98-070B

8930

28112

7590

01/23/2004

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EXAMINER

DIAZ, JOSE R

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 01/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/764,242

Applicant(s)

WONG, GEORGE

Examiner

José R Díaz

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 18-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 18-19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng (US Pat. No. 6,171,976 B1) in view of Applicant's admitted prior art.

Regarding claim 18, Cheng teaches a semiconductor substrate (see fig. 6) comprised of:

(a) a patterned conductive layer (see col. 2, lines 64-67) forming portion of semiconductor devices (210) and patterned fill layer (212) in said kerf areas (204) (see fig. 6);

(b) a spin-on-glass layer (220) over said patterned conductive layer (210, 212) converted to a planar silicon oxide layer (see col. 3, lines 29-31);

(c) an insulating layer (216) on said silicon oxide layer (220) (see fig. 6).

In addition, Cheng teaches that the disclosed invention is usable for VLSI and even for ULSI process (see col. 1, lines 19-20).

However, Cheng is silent with respect to the teaching of forming a multilevel of metal layers. Applicant acknowledged ULSI circuits requires more levels of metal to

effectively interconnect the high density of discrete devices on the chip (see last paragraph of page 1, and lines 1-8 of page 2).

Cheng and Applicant's admitted prior art are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to provide additional levels of patterned conductive layer. The motivation for doing so, as is taught by Applicant, is effectively interconnecting the high density of discrete devices on the chip (page 2, lines 2-5). Therefore, it would have been obvious to combine Applicant's admitted prior art with Cheng to obtain the invention of claims 18-19 and 21-22.

Regarding claim 19, Cheng teaches that the conductive layer is a metal (see col. 4, lines 39-40).

Regarding claim 21, Cheng does not teach the limitation of wherein spacing between the patterned fill layers and the die areas in the range is not greater than about 2  $\mu\text{m}$ . However, it would have been obvious to one of ordinary skill in the art to include the claimed spacing range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. The ordinary artisan would have been motivated to modify Cheng in the manner described above for at least the purpose of improving the uniformity of the chemical mechanical polishing process and avoiding the dishing effect (col. 2, lines 9-11 of Cheng).

Regarding claim 22, Cheng teaches that the kerf areas have a width of between about 120-600  $\mu\text{m}$  between said die (see col. 2, lines 58-59).

2. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng (US Pat. No. 6,171,976 B1) in view of Applicant's admitted prior art, and further in view of Lou (US Patent No. 5,759,906).

Regarding claim 20, Cheng teaches that the patterned fill layer (212) and the device layer (210) are formed from the same material (see col. 2, lines 64-67).

However, Cheng is silent with respect to the metal material used to form said patterned conducting layer. Lou teaches that it is well known in the art to form an aluminum of about 6000 Å as the patterned conducting layer in the areas in which integrated circuits will be formed (see col. 5, lines 34-39 and Figs. 3-11).

Cheng, Applicant's admitted prior art and Lou are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to include a patterned conducting layer of aluminum having a thickness of about 6000 Å. The motivation for doing so, as is taught by Lou, is to provide a high electrical conductivity (col. 5, lines 33-34). Therefore, it would have been obvious to combine Lou with Cheng and Applicant's admitted prior art to obtain the invention of claim 20.

### ***Response to Arguments***

3. Applicant's arguments, filed December 12, 2003, with respect to the rejections of claims 18-22 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Cheng (US Pat. No. 6,171,976 B1).

***Conclusion***

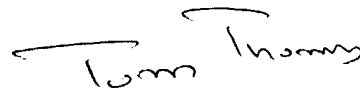
4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Beilstein, Jr. et al. (US Pat. No. 5,804,464) discloses a conductive material formed in a kerf area (fig. 1), and Cronin et al. (US Pat. No. 5,691,248) discloses filled kerf area (37) (see abstract).

***Correspondence***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078 or (571) 272-1727, after February 9, 2004. The examiner can normally be reached on 9:00-5:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Tom Thomas

JRD